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AUTHOR	Mackey, William Francis
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ABSTRACT

This study presents the theories that contribute to what the author has called geolinguistics, a discipline that deals with the external fate of languages as they are distributed over the face of the globe. Such a study is relevant in terms of official language planning when legislators seek to impose a given language on people of varied backgrounds. Such language planning requires the study of the linguistic forces of a given situation, including such characteristics as language power, language attraction, and language pressure. The author defines, illustrates, and discusses these terms and indicates their application to his theory of geolinguistics. (VM)

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LANGUAGE STATUS
and
LANGUAGE CONTACT
in Geolinguistic Perspective

William Francis Mackey

International Center for Research on Bilingualism. Laval University.

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Lecture prepared for the Foreign Language Education Center of the University of Texas at Austin. April 1972.

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FOREWORD

The purpose of this paper is to present a few key concepts for a whole new area of study which I should like to call geolinguistics. This discipline would deal with the external fate of languages as they are distributed over the face of the globe -- with the linguistic implications of such facts as the use of only 5% of the world's languages by more than half the world's inhabitants -- or 12% by almost three quarters of its population -- or the jurisdiction of only three countries over half the population of the planet covering about a quarter of its land mass. These countries, China, the Soviet Union and India have each a main national language; yet within their borders, hundreds of other tongues are spoken, only a few of which have official regional status, a fact which creates social tension in situations of language contact -- and this is what the following proposals may lead to predict. To study such problems, I should like to introduce three geolinguistic concepts -- the concept of language power, that of language attraction and that of language pressure.

By way of an introduction, I try to show that geolinguistic concepts are not purely academic and that the understanding of geolinguistic forces can save countries a lot of money, a lot of time and -- in some areas -- a lot of lives.

Although language is a universal element in human affairs, governments have generally simply taken it for granted, despite the fact that most countries need some sort of language legislation -- if only to decide what foreign languages may be taught in the schools. But it is chiefly in bilingual and multilingual countries that language regulations become questions of vital importance -- and sometimes matters of national survival. This is especially true in regulations governing education -- notably the language or languages of instruction in schools in areas of language contact.

INTRODUCTION

Legislators have rarely gauged or even understood the extent to which it was possible to change the language behavior of their nationals by means of laws and regulations -- a lack of comprehension which has often led to catastrophe.

To cite only one example, take the case of India. A quarter of a century of legislative effort has failed to replace English by Hindi as a national language in India. In 1948, it was decided not to organize the newly independent British colony along linguistic lines and to use the majority language, Hindi, as a uniting national tongue. According to the Constitution of 1950 English was to disappear by 1965 as a national language -- that is, as the language of parliament and the civil service. The linguistic forces within the country, however, decided otherwise.

In the southern part of the sub-continent, which is mostly Dravidian, the fight was not to do away with English -- but to maintain it while up-grading, not Hindi, but one of the regional languages. Consequently, in 1967, the central government countered with a regulation whereby the regional language was to replace English, by 1972, as the medium of instruction in schools and colleges. This move was interpreted by many non-Hindi speakers as a subterfuge to create a cultural vacuum which would eventually be filled by Hindi, the strongest remaining language and that of the majority. This resulted in linguistic revolts, resignations from the cabinet and the opposition of most Indian universities.

Meanwhile a number of Indian peoples revolted and claimed the right to create separate states in which their language would become official. After a long series of bloody encounters, the central

government had gradually to yield to crisis after crisis -- first in Andhra, then in Bombay, Madras, the Punjab -- and the struggle for linguistic self-determination continues. In sum, the legislators had completely to reverse themselves, both in their opposition to the official maintenance of English and to the creation of linguistic states. The moral is that one cannot legislate lightly questions of language behavior which involve the degradation of regional languages; and a people having to choose a strange idiom as a working medium may well prefer a high-status international language to a rival regional tongue -- no matter how widespread. The Cameroons for example have chosen two foreign languages -- English and French as the only official languages of a country where dozens of native languages flourish.

This is often noticed in the history of bilingual education, especially in studying the causes of success and failure in bilingual schooling. The success or failure of the use of another language as a medium of instruction will largely depend on the status of that language. It makes a difference whether or not it has legal status and whether that status is national or regional. Probability of success may also depend on the international status of the language. If the language is one of wide or extra-national communication, like English or Spanish, the situation is bound to be different from that of a local Amerindian language spoken by only a few tribes.

Language legislation which fails to take into account the linguistic situation and its multiple variables is likely to fail. Language legislators have rarely realized that they are dealing with linguistic forces -- often beyond their control, that all languages are not equally powerful and that in any given context of language contact one language may have a greater force of attraction than another. Such forces have affected not only officially bilingual countries like Switzerland[1], but also many of the developing countries[2,3,4]. It is the analysis of such linguistic forces, one would

imagine, that should become the starting point of all language legislation, since it is the grouping and power of such forces that will ultimately decide what is possible, what is impossible and the extent to which one can expect to modify through legislation the extension or even the survival of a language. But it is not sufficient to grant official status to a language to assure its survival, for there are forces above and beyond political status that decide the fate of languages.

What are these linguistic forces which decide the prestige and staying power of languages? What makes one language attract more new speakers than others? Why does one language often dominates others in situations of language contact? To what extent can we identify and quantify these forces?

These are not simply questions of classifying language communities[5] or of identifying types of national languages, whether they get their power by *abstand* or by *ausbau*; it is an effort to measure the forces ultimately responsible for the life and death of languages.

It would be prudent to begin with a couple of basic postulates -- to start with some statements which may appear self-evident. First, it is not the linguistic structure of a language that gives it power and prestige. It is rather its function as a medium which permits one to communicate what and with whom one considers important in such matters as education, business, science, culture, religion and amusement. Second, the importance of a language is derived from the people who have used it -- their number, wealth, mobility, economic and cultural production, factors the accumulation of which constitute the innate status or force (F) of a language.

In addition to this status, each language has a power that is relative to that of any other language with which it may come in contact. This force of attraction depends not only on the innate status of a language but also on the extent to which it differs from

the other language and the distance between the speakers of the both languages. These differences constitute what we may call the attraction of one language for speakers of another language. For example, even though English for demographic, economic and cultural reasons -- may surpass Dutch, it is the latter which has the greater attraction for Frisians. Yet independently of this, English maintains an attraction for Frisians as it does for speakers of other tongues. So that in order to measure the force of attraction of two or more languages and the pressure which one may exert on the other, we must first calculate the status, or language force, of these languages.

1. Linguistic Forces (F)

Language power (F) could be defined functionally as the sum total investment in time, money and energy that is made for the purpose of learning or preserving a particular language. It can also be described, regardless of interlinguistic distance and geographic contiguity, as the probability that so much investment will be made to master or maintain a foreign, second or regional language.

The motives which fuel linguistic forces are rarely linguistic. They are rather demographic, economic, cultural and generally extralinguistic. Such motives can be studied; and the demographic power of the native users of any language, their dispersion, mobility, economic, ideological and cultural influences can be measured. It is the sum total of such indicators -- demography, dispersion, mobility, economic, ideological and cultural production -- that can be used to gauge the intrinsic force of a language.

1.1 The Demographic Indicator (D)

When one thinks of the importance of a language, the first thing that comes to mind is the number of speakers. Demographic differences have indeed been used in the past to measure the probability of communication between two groups.[4] When it comes to numbers, one thinks of some 800 million Chinese and wonders why their language is not the most important one in the world -- even though it includes,

outside of the official Mandarin, some fifty main dialects and about a thousand local dialects, more or less inter-intelligible. It is because the influence of the number of speakers, indispensable as it is to the greatness of a language, is in this case greatly attenuated by the weakness of other characteristics such as income, economic production and technology. The economic power of China, for example, has been less than that of less populous countries. In other words, our demographic indicator is a function of the size of the units counted. One measure of such size is income, so that an appropriate demographic indicator for language influence would be the total population (p) times the average income ($\bar{r}$), or simply the total income of all native speakers of the language (see table 7, col. 1).

$$D = p\bar{r}$$

1.2 The Dispersion Indicator (R)

The total power of a language does not, however, depend only on the number and material value of the people who speak it. It also depends on where these people are. Five hundred million people in one spot will have less influence than a hundred million in five places. How can we find an index to measure this repartition (R) of the speakers of a language in such a way as to preserve the concept of the viable speech community? There are many measures of repartition; but what is needed here is one which will not duplicate the demographic indicator, which already takes the total population into account, and one which, at the same time, does not neglect the importance of the size of the communities to be found in various parts of

the globe. One way of doing this is to exclude from our calculations the size of the most populous community, which is often but not always the demographic center, and to indicate the way the rest of the population (p) is dispersed.

So that: $\Sigma p - max\ p = Rp$

The value of R can now be calculated by weighting the size of the communities in categories of one to ten millions, one million being the minimum. Communities between one and ten millions (R_1) could have a value of 1 ($1R_1$), those between ten and twenty millions a value of two ($2R_2$) and so on (NR_n). So that,

$$R = \sum_{i=1}^{n} NR_i = 1R_1 + 2R_2 + 3R_3 \ldots + NR_n$$

(See Table 1, col. 2). If minor languages or communities of less than a million are to be brought into the picture the population can be expressed as a fraction of 1:

$$(.1R,\ .2R \ldots\ .9R,\ 1R,\ \ 2R \ldots\ NR_n)$$

If a more refined formula is needed -- one in which the distance between the speech communities enter into the calculation -- this new dimension can be brought in as a product, that is, the average population of the pairs of communities times the distance (d) between them, the summation of the sequential value of such pairs giving the value of R. If there are two communities, for example,

$$R = d\left(\frac{1R_1 + 2R_2}{2}\right)$$

The general formula therefore would be:

$$R = \sum_{i=1}^{n} d\left(\frac{NR_n + (N+1)R_{n+1}}{2}\right)i$$

It is the sequential distance (d) between each pair of communities that is measured (between A-B, B-C, C-D,... Z-A), that is, between each community and the *next* nearest, one after the other, to complete the circuit. Such a measure, for example, would give a higher dispersion difference between English and Spanish than does the first formula (see Table 1, col. 2).

1.3 The Mobility Indicator

Dispersion however is not the same thing as mobility. If the Germans have been more mobile than the French, it is not because their language is official in so many parts of the world. It is because they have traveled widely as tourists, businessmen, students and professors. So have the speakers of English. More than three million Americans, for example, visited Europe in 1970 -- transmitting to millions of European ears the sounds of their dynamic and difficult tongue. During the same period, about a million French nationals visited neighboring European countries as summer tourists, while about the same number Italians went to Northern Europe, many of them on temporary work permits.

How are we to measure this phenomenon of mobility? We could do so in man-miles or man-kilometers. But how could we ever find out the distance covered by each person who leaves his country? We do

know or can find the number of foreign nationals who enter certain countries each year and we also know the distance between countries. It is therefore possible to arrive at a useful indicator which would represent total man-miles of speakers in distances between population centers. The formula for our mobility indicator (M) sould therefore be:

$$M_y = \Sigma(n \times d)_y$$

n = being the number of nationals of countries with the same official language

d = the distance between the population centers of the countries of these national and each of the countries visited

y = the year (e.g. 1928).

For example, although West Germany and France are both adjacent to Switzerland, the number of Germans visiting that country is twice as great as the number of French (see Table 1, col. 3).

Since figures are taken from nationality rather than from native language, a more refined measure could weight these nationality figures according to percentage of speakers in each of the countries the mobility of whose nationals is taken into account.

1.4 The Economic Indicator (E)

The number and variety of goods and services produced have been used as indicators of the economic power of a nation. Statistics are available giving the gross national product (GNP) of most coun-

tries. This index is not the same as the total income of the population since the one does not necessarily determine the other; for industry or the State may use profits for investment or for purposes of national prestige abroad. The total income of the Japanese is not the same as the gross national product of Japan. In some countries, where all production is controlled by the state the relation between income and production can be purely arbitrary.

It is true that there are economic indicators other than the *GNP*, but the latter being the most widespread and the most available, it may have to serve until a better one is standardized.

Our economic indicator (E) can be the sum of the *GNP*s of all countries of the same language:

$$E = \Sigma(PNB)$$

In ethnically segmented nations, however, when the *GNP* of people speaking one language is significantly lower than that of speakers of another language, the *GNP* can be weighted by language group. But such linguistic-economic segmentation is not a rule (see Table 1, col. 4).

1.5 The Ideological Indicator (I)

Money is not everything, as the saying goes, and this seems to be true for the spread and influence of languages. In fact, certain economic forces can be neutralized by the impulse of a powerful ideology.

The spread of the great proselytizing religions -- Christian-

ity, Mohamedism and Budhism -- some of them proclaiming the value of poverty -- succeeded in extending the influence of Latin, Arabic and Sanskrit to the four quarters of the globe.

The linguistic influence of religions can be intensive as well as extensive. The intensity of belief and practice is likely to vary from one area to another. The practice of Catholicism in Latin America has not had the same intensity as it has in Ireland. And to be a Moslem in Arabia has not been the same as being a Moslem in Indonesia. In some countries religious practices are much laxer than in others. There is also the influence of religious syncretism in many parts of the world, a phenomenon which official statistics do not take into account. For belief in one religion may co-exist with belief in another; for example, certain urbanized Amerindians in Brazil who are practicing Catholicism also believe in and practice fetish worship. Adulteration of the faith and laxness of religious practices lead to a neglect of the language of the ritual.

All ideologies are admitedly not religious. There are also highly influential secular ones such as Marxism, Leninism, and Maoism, which may indirectly lend prestige to the language of the true texts. Availability of these texts could also be interpreted as a cultural factor (see below). But one cannot put a language which is simply associated with an ideology in the same category as one which is indispensable to the practice of a religion. The Latin language was thus placed in a different category of power when the Church of Rome abandoned it as the international idiom of the Roman Catholic liturgy,

thus enormously reducing the power and prestige of a language which for centuries had been one of the world's most dominant.

It would be wise for us to limit our ideological indicator to foreign liturgical languages, that is, to languages used for liturgical purposes by those for whom it is a foreign tongue, or in countries where it is not the major native language of a special community. Our ideological indicator (I) could then be equal to the number of adherents to religions using a foreign liturgical language (AFL); for example, the population using Hebrew in synagogues outside Israel and the number using Arabic in Moslem rituals in non-Arab countries (see Table 1, col. 5). Of course, the degree of exposure to the language depends on the frequency of liturgical participation; but until such frequency figures are available we shall have to be satisfied with a less refined measure:

$$I = \Sigma(AFL)$$

1.6 The Cultural Indicators (C)

Another non-economic indicator is the linguistic influence which accompanies the spread of a culture. The great cultural influence of Athens and Rome helped spread Greek and Latin, for two millenia, over the Western World.

Before attempting to measure the language-related cultural forces it would be wise to seek a functional definition which could be used as a basis for quantification. As a starting point, we could postulate a relationship between cultural activity and cultural

production, between, for example, the number of copies of a work and its possible influence, the number of works read in a given language and the possible influence of that language.

The number of publications in a given language may also be a function of its degree of standardization. No matter what the regional vitality of a creole may be, writers are rarely prepared to produce in it when the standard form is available. A Haitian intellectual will tend to have his works published in standard French. It is also the high degree of standardization of the French language which makes it attractive as a school language in certain countries, in addition to the fact that once this standard language is understood a great wealth of cultural productions -- in science, the humanities and technology -- becomes available. English is in a similar position.

The number of titles or number of copies of all books produced in a given language could well be used as an indicator of the cultural potential of this language. But it remains a potential whose value depends on the extent to which the language is used. The libraries of Europe for example are rich in the cumulative productions of two great languages -- Latin and French. But the number of Europeans capable of using the books in Latin is undoubtedly quite inferior to the number able to read the French books. This is reflected in the fact that the annual demand for French books is higher than the annual demand for Latin books.

If we are to use book production as an indication of cultural power we must take into account both the cumulative effects of

the past and the cultural dynamism of the present. The first is reflected in library holding; the second in book production.

The number of books in the libraries of a country is an indicator of the cultural wealth of that country, even though many of the books may be in a foreign language. This is the most available indicator since most countries keep some sort of library statistics. So that our first cultural index would be the total number of volumes in libraries of countries using the same language (see Table 1, col. 6). A more refined index would be the total number of books in all the libraries of the world classified according to language. But these figures are not readily available. A still more significant indicator would be the total world library circulation by language -- figures also difficult to obtain. For purposes of illustration therefore, we must be satisfied, as one indicator (C_v), with the total number of volumes (V) in libraries of countries using the same language: $C_v = \Sigma V$.

This indicator, however, would have to be supplemented with a second one which reflects actual demand and creativity. One indication of this is the number of books or titles published. This is a feasible indication, since national book production figures are available. Some corrections, such as those for imprints of multinational publishers, would have to be made. But the total number of books produced by any given country gives some indication of its cultural impact and the influence of its language. If all books (B) published by countries using the same language are totaled, the total

reflects the cultural influence of that language (see Table 1, col. 7). Our second cultural indicator could thus be simply formulated as: $C_b = \Sigma B$.

A greater refinement in the value of C_b could be introduced by using figures for book production by language, if available, rather than by country, since some countries produce books in foreign languages.

Books produced in a country are not necessary originals; they may be translations from other languages into the national language. Although the very ability to produce and publish such translations is an indication of cultural power, the proportion of such translations is an indication of cultural dependence. If most books in a given language are translations from another language, it is an indication that more of the books worth producing are written in that other language; and if there are enough of them, this very fact might incite people to learn this other language in which so much interesting work is available. In addition to our indication of cultural power we need an indicator of cultural independence or dependence (C_d). This can be stated as the proportion of books produced as translations, that is, where the language is the target language (T):

$$C_d = \frac{\Sigma T}{\Sigma B}$$

If the result is 1, as it would be in some language whose literature is limited to translation of portions of the Bible, it would indicate complete dependence.

We could also measure cultural influence as the extent to which a language is used as a source, indicating cultural productivity in that language, in contradiction to the use of the same language as a cultural receiver or target language. A language used more as a source than as a target shows that much more cultural independence. By subtracting the percentage of the annual book production representing translations from another language, that is, where the language (L) is the target language (T), from the percentage of the annual production of other countries where the same language is the sources, we obtain an indication of cultural influence (C_i):

$$C_i = \frac{L_s}{L_s+L_t} - \frac{L_t}{L_s+L_t}$$

For example, if we substitute (E) -- English -- for (L), we would take the total number of titles which are translations from the English (s) as a percentage of total titles and from this number subtract the total number which are translations into English (t) also as a percentage of total English titles, we should probably get a plus figure. If however, we do the same for a language like Cree, we would probably get a minus figure. This minus figure would indicate the degree of dependence, whereas the plus figure indicates the degree of cultural independence.

One could argue that our cultural indicators of library holdings and book production would include a measure of our ideological indicator -- that is, books for the foreign language liturgy; witness the number of Latin missals produced when that language was the official

and international idiom of the Roman Catholic Church. There would be an overlap, however, only if our cultural indicator showed the number of copies; as it is, it indicates only the number of titles of which any religion has a limited number for its liturgy.

Book production is not of course the only indication of cultural activity. A people may be highly productive in many other areas such as cinematography, radio and television broadcasting, productions which enable people to hear their language. If the correlation between these oral media and the written media are high enough, the latter may still be the more useful indicator.

There are, of course, other types of cultural production, such as sculpture, painting and music; but they are not language related. It is possible to enjoy foreign music, foreign painting and foreign food without necessarily learning a foreign language, although such enjoyment may well dispose us favourably toward that language.

We have selected indicators from six areas of possible language power -- demography, dispersion, mobility, economical wealth ideology and culture. Those selected are not the only possible indicator however. We could have used such indicators as literacy, urbanization, educational level, newspaper circulation, political stability, population homogeneity, mail, number of telephones and radios, number of theaters and cinemas, incidence of crime, level of employment, mortality, marriage rate, property distribution, social security, confessionality, exports and imports --- and any of about a hundred such measures. Yet, and we still have to justify this exclusion (see Validation below).

The indicators chosen, however, seemed both feasible and language-related. Indicators must be selected for the purpose we have in mind. The purpose may be political, descriptive[9] or comparative[10]. On the other hand we may be interested in ethnic components[11] or in social, cultural[12] or economic comparisons[13]. The method used in exploiting such indicators has been to calculate correlations between them in order to establish such general traits or political stability, economic independence and democratization. It has been possible to establish some constant associations between certain levels of political and social activity[14]. A high correlation has been noticed between urbanization, literacy and political participation[15]. There even seems to be a correlation between some of the indicators we have used and those we have omitted. A positive correlation (of .888) has, for example, been established between the *GNP* and education, between the *GNP* and the number of engineers and scientists (.883), of doctor and dentists (.700) and of teachers (.755)[15].

These have been used to indicate differences between countries. Here we are interested in correlations to help us establish differences between languages -- external and measurable. Differences between political units are useful to us only in so far as they indicate the relative power of the external characteristic of languages -- regardless of political boundaries.[16] In other words we are not interested in political frontiers but in linguistic ones.

Although the number and type of such indicators will have to be rigorously determined (see Validation below), we can still

advance a general formula for the measurement of linguistic force (F):

$$F = \sum_{i=1}^{N} X_i^x$$

That is, the sum of whatever number (N) of comparable and weighted indicators (X^x). By way of illustration, we have used the following indicators:

$$X_1(D),\ X_2(R),\ X_3(M),\ X_4(E),\ X_5(I),\ X_6(C_v),\ X_7(C_b).$$

Perhaps our correlation will permit us to use only a single indicator -- or very few of them. But the closer we are to the community level the less value will the correlation be. For example, in measuring innate language power, a high correlation between book production and newspaper circulation may enable us to eliminate the latter. But if we are interested in language pressure at the community level both indicators count, since they all have a cumulative effect (see Pressure below). The same holds true when we study the force of attraction between two or more languages.

2. Language Attraction (A)

The different status of languages can be seen when they are in contact. The difference shows up as a component in the attraction or repulsion which one language -- or rather those who speak it -- may have for the other language. But it is not the only component; there is also the geographic distance which separates the groups and

the amount of difference between the languages -- the interlingual distance. The attraction of one language for another depends, therefore, on the differences in status, in territorial distance and in interlingual distance.

2.1 Status Attraction ($F_{a/b}$)

The attraction of one language for another does not depend on the intrinsic power of each but rather on the amount of difference in their language power. French and German, for example, are two great languages of comparable status; but there is likely to be less attraction between them than between either of them and a less powerful language like Basaa, a language which attracted neither the German nor the French colonizers of the Cameroons, where it was rather the speakers of Basaa who mastered, successively, German and French. It is that these two languages are to a great extent self-sufficient, in the sense that speakers of either can realize most of their aspirations in their own language.

How can one calculate the relative power of two languages? One must first identify the languages and dialects which enter into a situation, whether it be one of language learning, language contact, or language use as, for example, a medium of instruction. It is important that all languages and dialects in the situation be accounted for in order to divide the amount of attention they attract into the right proportion. Although most situations are likely to involve two languages, others may include three, four or more. By way of example we shall use only two languages. If one of the lan-

guages is used, for instance, by a population of 90 million and another by a population of 10 million (a combined total of 100 million), the demographic proportion is, of course, 9 to 1 or 90% to 10% -- a difference of 80%. By thus reducing our language power (status) indicators to proportions it is possible to calculate the degree of difference in language power of any combination of languages. Each indicator (X), which may or may not be weighted (see above), can be expressed for each language as a proportion of the combined values of all the languages involved in the situation (Languages a, b, c...). The degree of difference for two languages can be expressed thus:

$$X_{a/b} = \frac{a}{a+b} - \frac{b}{a+b}$$

(a being the figure obtained for Language a according to the indicator (X), and b being the corresponding figure obtained for Language b). To make the differentials comparable it would be wise to express $F_{a/b}$ as a percentage, that is, by a figure whose maximum is ±100.

2.2 Territorial Attraction ($T_{a/b}$)

The attraction which one language can have for speakers of another language or dialect will depend on the probability of reciprocal or non-reciprocal (reading or hearing the language) contact. Even a powerful language can have little attraction for a people who have no possibility of ever hearing or even reading the language. In other words, the force of attraction of a language, is increased by contiguity and decrease by distance.

People have always been influenced by their neighbours, and this influence has often been linguistic; they have been less influenced by distance strangers -- even the most powerful ones. The Finns of Finland are much more likely to learn Swedish than they are Spanish; but Finns in Brazil will be more likely to learn Spanish than they will Swedish -- after, of course, having learned Portuguese.

The attraction of contiguity has itself been attenuated by the presence of natural barriers -- mountains, lakes, and rivers -- factors which have been invoked to explain the different degrees of divergence within the same family of languages -- as, for example, the Latin-Romance family.[17] It may be that the increased facility of communication has reduced the effect of such natural barriers. There are however artificial barriers created by inviolate political frontiers and a policy which reduces by force all communication from and to the outside. There always remains however the constant of terrestrial distance (T).

The quantification of terrestrial distance between linguistic groups is not without its problems. National boundaries are not always congruent with language boundaries. There are often wide transition areas between one language and another. The distribution of the population speaking one language may be quite different from that of the other language; it may be diffused or rural in one case and concentrated or urban in another. Terrestrial distance between different language groups must therefore take into account not only the distance between language frontiers (f), but also the distance

between population centers of gravity (g).[9] By averaging the two distances we obtain a truer measure of the distance between peoples. For example, if we have three language groups (a, b, and c) whose population centers are equidistant (120 miles or kilometers) but whose language boundaries are not (a borders on b, both being 120 miles -- or km -- from c). The difference between the terrestrial distances from a, of b and of c would be:

$$f(a \rightarrow b) = 0 \qquad f(a \rightarrow c) = 120$$
$$g(a \rightarrow b) = 120 \qquad g(a \rightarrow c) = 120$$

$$T(a \rightarrow b) = \frac{b+g}{2} = \frac{0+120}{2} = 60$$

$$T(a \rightarrow c) = \frac{b+g}{2} = \frac{120+120}{2} = 120$$

Terrestrial distance diminishes the force of attraction which one language can have for another. Suppose for example that in relation to Language a (above) Languages b and c have a comparable demographic status, that is, the population of speakers of Language a is nine times greater than that of either b or c and that there is, in both cases, an 80% difference in favour of a:

$$a - b = 90\% - 10\% = 80\%$$
$$a - c = 90\% - 10\% = 80\%$$

On the face of it, a would be equally attractive to b and to c. But since it is twice as close to b as it is to c, on the basis of the above calculation it would be twice as attractive to speakers of b as it would to speakers of a.

If no alternatives are involved however, how can one integrate distance with language power? One way is to reduce both to percentages. We have done this for differences in language power. Let us do the same for terrestrial distance.

By scaling terrestrial distance between the minimum (0) and the maximum (half the circumference) we have a range of 0 to 12,451 miles. Dividing this into 100 units of approximately 120 or 125 miles, we get a scale from zero to 100 which is comparable with our percentage differences. On this scale the above distance between Language groups a and c would be about one unit of distance (120 miles), reducing the power difference (80) on a global scale by about one unit:

$$F_{a/c} - T_{a/c} = 80 - 1 = 79$$

To maintain our maximum at 100 for comparative purposes we would have to divide this by two:

$$\frac{F_{a/c} - T_{a/c}}{2} = 39.5$$

2.3 Interlingual Attraction ($I_{a/b}$)

Up to this point we have been dealing exclusively with the external features as the indicators which largely determine the power and attraction of languages. But there are also internal differences which are by no means negligible. For the very resemblance of languages or dialects can in itself constitute a force of attraction. It has been pointed out, for example, that Italians seem to have more affinity for French whereas Germans are more attracted to English.

The quantification of linguistic differences (interlingual distance) is a highly complex matter since it supposes not only the juxtaposition of two or more systems of systems but also of two or more transformational mechanisms between each system and the corresponding chains of discourse.[18]

There are as yet no indices of the degrees of differences among the languages of the world. One could attempt to use some simply soundings such as those practiced in glotto-chronology where a small set of highly frequent words is compared with the equivalents in one, two or more other languages. The proportion of equivalents with different forms gives the degree of divergence. If this technique, which has been used to study the temporal distance between genetically related languages, can be validated for the measurement of the degree of inter-intelligibility of unrelated languages, it could become a usable indicator of interlingual differences.[19]

Just as geographic distance diminuished the force of attraction between languages, so does interlingual distance. Conversely, the closer the languages in geographic and interlingual distance the greater the attraction exerted by the imbalance in language power. Maximal attraction is exerted by a powe[illegible]l highly standardized language along a language boundary shared by one of its weaker dialects. The dialect speakers will tend to learn the standard language; but not vice versa. Minimal attraction will be found between two weak languages such as Aranda (Australia) and Micmac (Eastern Canada) -- languages separated by a great geographic and interlingual distance.

Most situations are, of course, not so simple as these extreme examples might indicate. Contiguous languages may not at all interact because of the effects of deviance from a majority or elite standard.

The very power of a highly standardized international language may crush the status of its own dialects -- preventing them from having any influence which the attraction of contiguity might lend them in situations of language contact. This may put a dialect community in a position whereby the pressure from neighbors learning the standard version of their language forces them to modify their dialect in conformity with the standard. In other words, their language can only exert its attraction of contiguity if it is made to conform to the standard language -- or at least to what potential learners and those who advise them assume the standard language to be. In part of Western Canada, for example, the influence on the English-speaking population of neighboring French-speaking communities has been negligible even though the majority of secondary school students elect to study French as their only other language. They are influenced to do so, not by the presence of a neighboring French-speaking community, but rather by the international influence of French which they believe to be imbibing in its purest form, and not in the form spoken by their neighbors, which, they are told, is not "real" French. So that the more enthusiastic they become about the French language the less attracted are they by the language of the neighboring community; and they express a fear of contaminating their French by dialectical forms, or most often by the very words of their own English which

their French-speaking neighbors have adapted. Sensing this, the French-speaking community, in order to gain status, through their language with their neighbors, may make an effort through more education to make their dialect conform to the international standard. The means to do so through their schools may however be refused by the English-speaking majority.

The diminishing influence of a dialect of a powerful standard is a function of terrestrial distance. Even when the interlingual distance is zero, geographic distance must be taken into account. Take for example the fate of the language of the Huguenots. They left France after the Revocation of the Edict of Nantes, and it seems that the further they went the less French they preserved. The few hundred Huguenots who settled in the Cape of Good Hope region in 1688 rapidly lost the use of their language, despite the fact they constituted at that time almost a third of the population of the Dutch colony. Huguenots who emigrated to Prussia, however, even though they constituted only a tiny fraction of the total population were able to preserve their French for many generations -- so much so that, the French college which they founded in 1689 was able, in 1964, to celebrate its 275th anniversary.[20] Geographic distance may not, of course, have been the only directly responsible factor in the different fates of these two language groups. It is well known that the Grand Elector of Prussia, in his Edict of Potsdam of 1685, formally opened his country to Huguenot immigrantion while encouraging the maintenance of their language, whereas the Dutch authorities on the southern tip of the African Continent and far removed from the international influence of

the French language discouraged its use by the Huguenots, while welcoming them as religious refugees.

We have already seen how two determinants of language attraction -- status difference and territorial distance -- can be integrated into a single measure. What now remains is the integration of this third measure -- interlingual distance. Taking up the same example of Languages *a*, *b*, or *c*, let us see how this can be done. If Language *a*, as exemplified above, is 80% more powerful than *b* ($F_{a/b} = 80$) the actual attraction of *b* to *a* will be determined not only by their geographic closeness but also by the degree of resemblance between the two languages. If the geographic distance between the two languages ($T_{a/b}$) reduced the potential of the influence of Language *a* or *b*, as we have seen above, by 1%, the power of attraction remains at 79%.

$$(F_{a/b} - T_{a/b} = 80 - 1 = 79\%)$$

Let us now suppose that the interlingual distance ($L_{a/b}$) between *a* and *b* is 20%; the percentage units based on validated equivalents (see below) would give a similarity of 80%. This difference would reduce the attraction of *b* for *a* by another 20 points, giving 59 as the remaining figure. This method of calculation thus makes provision for negative values, as would appear in the case of Aranda and Micmac. We could argue that the degree of similarity (e.g. 80%) proportionately increases the attraction. To keep the results in terms of percentages we could add this to the remaining 79 and divide by 2

$$\frac{79 + 80}{2} = \frac{159}{2} = 79.5$$

The general formula would then be:

$$A_{a/b} = \frac{\frac{F_{a/b} - T_{a/b}}{2} + L_{a/b}}{2}$$

Language attraction may be observed at the national and international level. At the local level, however, the component values are likely to change. The international status of English is not directly perceived by the Acadian worker, for example. He feels however, or is made to feel, that he is up against a powerful language. In addition to all these general forces of the language its function in the immediate environment of language contact constitutes a number of pressures on the individual and on the weaker or minority group in a situation of language contact.

3. Linguistic Pressure ($P_{a/b}$)

When the territorial distance ($T_{a/b}$) as we have defined it, gets below zero, that is, when there is contact and interpenetration of two or more language groups, language attraction becomes language pressure. The imbalance of linguistic forces ($F_{a/b}$) constitutes a social imperative or pressure on the minority to adopt some of the characteristics of the majority -- through various traits of bilingualism such as conceptual acculturation, diglossia, shift of home language, linguistic borrowing, bilingual interference. The greater the imbalance, the greater the pressure; and the closer the languages, the quicker the effects.

Anyone living in an area of language contact is likely to be exposed to various linguistic pressures according to the direction and degree of attraction between the languages. The cumulative effect of all the linguistic forces -- immediate and remote -- constitutes, as it were, a pressure which shapes the language behavior of groups inhabiting areas of language contact. What are some of the behavioral traits associated with these pressures, and what are some of their effects?

3.1 Behavioral Traits

If an individual lives in a community of intimate language contact, he cannot easily remain indifferent to the linguistic pressures which surround him. He is bound to be faced with decisions which may modify his everyday behavior. In which language is it better for him to work?[21] To what extent are his world of work, his education, his local and national government, his radio and television programs dominated by one language rather than the other?[22] In which language does he obtain most of his information about his immediate environment and the outside world? Such questions directly affect the language behavior of the individual.[23] This behavior can very well be described as a network of linguistic acts surrounded by the pressures which shape them. For it is in large measure the fruit of cumulative linguistic forces, such as already defined -- demographic, geographic, cultural, economic, educational and administrative -- applied at the global, national, regional and local levels.[24] It is therefore as an extension of the linguistic forces (F) that we can measure the pressure (P) of one language upon speakers of another

language. The simplest and most comparable way to do this is to express the pressure of each language (a and b) as a proportion of the total force, by combining the figures obtain for both language ($a+b$), according to each indicator, and by summing the differences:

$$P_{a/b} = \Sigma\left(\frac{a}{a+b} - \frac{b}{a+b}\right)$$

As an illustration let us take the linguistic pressures to which Acadians in the Moncton area were exposed in the year 1961 (see Table 2).

One of the deepest effects of such pressures is their shaping of the conceptual world of the individual and the group, that is, the changes to be observed in the acculturation of concept categories.

3.2 Concept Acculturation

The individual and the group in areas of language contact may undergo an imperceptible verbal influence whose long term and cumulative effect is to be observed in the way concepts are formed and labeled.[25]

To illustrate this, we examined through sets of controlled word association tests some of the concept domains of forty-one ten-year-old Acadians with French as a home language, living in the same bilingual area and undergoing the same pressures from both English and French. To each we administered ten tests, each of 15 minutes duration, covering five conceptual domains, namely: actions, instruments, transportation, religion and sports. The tests were first given in French, and three months later in English. In each test, the subject supplied all the words he could write on the domain tested within the alloted time. The most obvious result was that, no matter in which

language the subject was supposed to be thinking and answering, the combined lists of words in three of the domains were to a certain extent bilingual. In other words, certain concepts were associated with one language rather than the other. The number of concepts so associated depended on the cultural domain; religious concepts were associated with the French language, whereas concepts of transportation, instruments and sports tended to be associated with English, indicating a degree of conceptual acculturation. It was as if this little group was undergoing selective pressures from both languages so that in each domain one of the languages was dominant. And the extent of the dominance varied according to the domain; the greatest degree of English dominance was, for example, in the domain transportation -- particularly the automobile.

For each domain the degree of conceptual importance which each language represents in the minds of the member of a group can thus be measured. Three first-order variables are available from the test results:

i) the total number of words, that is, of word occurrences (tokens) for each language in each domain (see Table 3, line 1);

ii) the number of different words (types) in each domain and for each language (see Table 3, line 2);

iii) the number of word types in each list which belong to the other language, e.g. English words in a French list (see Table 3, line 3).

This enables us to calculate the degree of linguistic interpenetration and concept acculturation (see Table 3, line 4).

By plotting the results on two interfacing scales, we can easily visualize the extent of conceptual interpenetration in each domain.

Flanking this picture of the effects of linguistic acculturation with another interfacing pair of scales illustrating some probable causes (Table 2) we get a model of language pressures which a community can undergo when faced with two languages of unequal power.

This, of course, is only an illustration of a possible model based on a number of possible indicators. Before using it as a basis for large-scale surveys it would have to be validated through several phases of experimentation. One would also have to determine which pressures affected which domains in order to discover the most significant domains for testing, and within each, establish appropriate measures such as rank-order and type-token ratio.

4. Validation

Plausible as they may seem, these geolinguistic concepts of power, attraction and pressure still have to be validated. If we can prove that language power and attraction can be something other than political power and that they can exist independently from the power of any single nation -- although this may well contribute -- we are yet faced with the problem of validating our selection of indicators to find the right ones, the most efficient number and the correct

weights of each. We must also seek to integrate these into single measures for language power, language attraction and language pressure.

4.1 The Validation of Language Power

Language power can be considered as that set of forces or motives which make people learn and use another language. If the choice of this other language is free, we can rank-order for each country all languages according to the number of people learning them. We can also find the percentage or proportion of people learning one language rather than another. For example, in the decade between 1938 and 1948 in England more than 90% of secondary school students learning another language had chosen French. The proportion of those learning German and Spanish was much less; for every hundred studying French about 17 (17.4 to 16.6) had chosen German and only about 2 (1.8 to 2.7) has opted for Spanish.[28] It is possible to calculate the approximate percentage of a population studying another language and the proportion for each language. By totaling the populations for all countries according to language we can get an idea of the world total for each language.

In the case of interintelligible languages or dialects, however -- like certain varieties of Spanish and Portuguese -- a criterion of passive or non-reciprocal usage might be preferable. Witness, for example, the learning of English as compared with the use of Spanish in Brazil.

In the case where the choice is not free we must calculate the number of persons whom the authorities oblige to study a lan-

guage as their first foreign language, and also, as the case may be, as their second or third foreign language. The combined figures (F_1) could be used as a basis for correlation with the selected indicators.

Another variable for correlation (F_2) is the number of people using a language as a working language in countries where that language is not a national tongue. For example, certain international agencies and national or multinational corporations use a foreign language as a working language -- even in unilingual situation where all workers have the same native language. This is true in a number of European countries like Switzerland, Finland and Sweden where English has been used as a working language. History provides several other examples, such as the use of French by the Russian aristocracy in the 19th century.

A third variable (F_3) can be obtained from the measurement of linguistic attitudes through administration of attitudinal tests to representative samples of population. Since, however, attitudes may be positive or negative and may vary in intensity this variable would also provide indication of external linguistic weakness as well as strength.

In sum, there do exist manifestations of language status, of language power or force, or whatever we wish to call it (F_1, F_2, F_3...); and we can describe these as the effects of multiple causes or factors which may influence the choice of a language and the amount of investment which people are willing to make to master or to maintain it.

How many of these factors are there? We could name about a hundred (see above). But they are probably not equally valuable as indicators of language power. That is, they will not predict equally well the choice of another language by a group (F_1), its use as a working language (F_2) or a positive attitude toward it (F_3). We must find which of these many factors are the most reliable indicators. We can do this by determining which ones give the highest correlations, and proceding by factor elimination, retain the optimum number of dependent and independent variables. One must not forget, however, that the factors which influence language choice tend to have a cumulative effect. For the more a language group or ethnic community has in common, the greater its resistance to assimilation and acculturation. Witness, for example, the survival of Jewish communities in all parts of the world. The greater the number of factors favoring a language and the greater their cumulative value, the greater the resistance of the language. In other words, the type of correlation necessary to justify the elimination of a factor is a bi-directional one: either x or y can be eliminated only if x supposes y and y supposes x.

We retain only the indicators which best predict the value of F, so that an increase in their value is always associated with a corresponding increase in the number of people learning the language, or the number of states that require it, or an increase in attitudes favoring the language.

In thus measuring the relationship between the external characteristics of a language and indications of its influence, two problems reveal themselves. One is the compilation of statistics on language learning, language use and language attitudes; another is the method to be used to establish a proven correlation between the two sets of data. To solve the first problem, statistics of national and local education authorities could be compiled; but they would have to be supplemented by surveys and soundings for the variables of language use and language attitude. To solve the second problem, there are fortunately at our disposal a number of modern statistical methods of which multiple factor analysis and multiple regression seem promising.

4.2 The Validation of Language Attraction

Validation of the formula for the measurement of language attraction will depend on how well the language power equation stands up. The latter may come out with a positive or negative value; an attitude of great revulsion against a language can cancel out the effects of linguistic similarity and contiguity to give a negative value to the power of attraction.

Secondly there is the validation of the effects of territorial distance on interlingual attraction. If the effect of language power imbalance is decreased by distance at what rate is it decreased? In other words if we reduce the imbalance as we have postulated, by one percentage point per 125 miles (being 1/100 of half the circumference of the globe), we are assuming a fixed relationship between distance and influence; so we would have to prove that the

relationship is indeed of this type. In practice, however, the decreasing degree of influence could be logarithmic in character, in which case our values would be variable -- smaller values for small distances but proportionately larger values for long distances. Only experimental evidence, therefore, will determine whether the distance-influence correlation is a straight line or a curve. Thirdly, to what extent are similar languages more attracted than highly different ones? If they are easier to learn to what extent does this encourage people to learn them? There seems to be some evidence that easy languages are the most popular with secondary school students, if they are given a free choice. But what is the effect of similarly on attitude? Are people more favorably disposed toward partly intelligible languages? Here again experimental evidence is needed.

In testing these three components of language attraction, it might be possible to study one at a time by keeping the other two constant. The effects of language attraction could be described as the total number of native speakers of one language learning a certain other language. It could also be the total interpenetration of two languages over a given period as the sum of lexical loans for that period.

Each of these components would also have to be weighted. Take for example, the case of Finnish facing Russian on one side and English on the other. Because Finnish is linguistically as far removed from Russian as it is from English, and these two great languages are comparable in power, one might imagine that the contiguity

of the Soviet Union would be sufficient to neutralize the influence of English in Finland. But such apparently is not the case, since the attraction of English is strong enough to be maintained in Finland as one of the first foreign languages.

It would also be possible to check the direction of attraction by subtracting the weaker from the stronger indication of language power. The difference could be modified by territorial contiguity and language resemblance so that Language Group *a* has more attraction for *b* than *b* has for *a*.

4.3 Validation of Language Pressure

In situations of interlingual contact, as we have seen, these differences in power and attraction are expressed as pressures of one language group on another. But within the region, there may be other decisive elements not chosen as indicators of power and attitude. The press, education, and business may have been eliminated because of high correlation with other indicators; but at the local level, the language of reading, schooling, and work may prove decisive. Here the method of validation depends on comparative regional studies including description of domains of language usage and the weighting of factors operating in each domain. Since language pressure itself is revealed in language behavior, the behavioral results must be isolated by experimentation before there can be a useful correlation made between a type and degree of language behavior and a given factor of language pressure. For example, to what extent does the regular reading of dailies in a language determine the penetration of that language into the home?

Before these measures of language power, attraction and pressure can become widespread, therefore a long process of validation must be completed.

CONCLUSION

What we have tried to do is to point out the existence of three geolinguistic concepts and to demonstrate that they may be measured by the use of certain indicators. By means of these indicators it is possible to gauge the influence of a language on a group of persons.

Language power, attraction and pressure are not, however, blind forces which automatically determine the fate of each individual. They are forces which can be politically manipulated and consciously countered by organized counter-forces such as regionalism, irredentism, purism and separatism. History supplied examples of individuals and small groups who have changed the direction of entire language communities -- but only in cases where these communities possess a certain social dynamism combined with potential counter-forces capable of being integrated. Forces can be limited even to feelings of being different -- collectively different -- into a desire to upgrade this difference by some measure of self-determination. Even in such a highly centralized country as France such groups may be found. After centuries of centralization and linguistic conformism, the Basques, the Bretons and the Occitants have claimed the right to be different. For it is always within the context of something shared that people have tended to give meaning to society and its social activity.[26]

The possibility of success in the manipulation of linguistic forces, however, will depend on an understanding of their nature and an appraisal of their power. Anyone attempting such manipulation will eventually realize that there are limits beyond which the intrinsic power of a language cannot operate. One can perhaps coax a small plane to cross an ocean; but no amount of coaxing will enable it to reach the moon.

Another limitation to the possibility of establishing exact prognosis is the inherent instability of linguistic communities -- and indeed of society itself. Societies are not static. The forces which shape them are variable and their equilibrium is always unstable. Even before one can digest the mass of statistics which characterize a society, the data are already out of date. There are always built-in errors in statistical descriptions of speech communities, especially if they happen to be bilingual or multilingual.[27] We need a type of statistics which enables us to describe as a continuum the forces which we have just enumerated.

If we can succeed in measuring with tolerable precision, the potential of languages as linguistic power, attraction and pressure, we may be able to show legislators the extent to which they may expect, through linguistic laws and regulations, to modify the language behavior of man.

TABLE I

Seven Indicators of Languages Power
(tentative figures for ten languages)

Indicators	1 D millions	2 R	3 M (millions nd) [25]	4 E millions	5 I millions	6 C_1 millions [26]	7 C_2 [27]
Languages							
German	721,404 [4]	4 [5]	1,163	184,604 [4]	-	143	51,731 [6]
English	1,283,131	63 [7]	5,708	1,277,827	-	411 [8]	119,302 [8]
Arabic	35,084 [1]	27 [1]	188	40,277	353	2 [2]	2,781 [3]
Spanish	162,356 [10]	29 [11]	1,509	130,254 [10]	-	14 [12]	34,461 [13]
French	262,555	30 [14]	490	290,123	-	325 [15]	38,070 [22]
Hebrew	4,987	-	421	4,692	11	3	2,038
Italian	84,428	1	306	82,490	-	4	8,440 [23]
Netherlandais [16]	68,570	6 [17]	644	68,570 [18]	-	22 [19]	18,934
Norwegian	6,673	-	12	9,734	-	7	3,935
Russian	- [24]	1	12	320,000 [21]	-	1,259 [21]	74,611
	$D = \Sigma p^{\bar{r}}$	$R = \Sigma p$-max p	$M = \Sigma$(nd)	$E = \Sigma$(PNB)	$I = \Sigma$(ALE)	$C_1 = \Sigma v$	$C_2 = v$(p.a.)

(See also footnotes)

Footnotes to Table I

From the totals in Table I figures for the following countries were excluded, either because the population of the country was under a million or because the data were not available:

1 (Spanish Sahara), 2 (Morocco, Mauritania, Mali, Niger, Libya, Chad, Nigeria, Sudan, Iran, Yemen, Muscat and Oman), 3 (All Arab-speaking states outside United Arab Republic, Algeria, Iraq, Jordan), 4 (Liechtenstein, German Democratic Republic), 5 (Liechtenstein, Luxembourg), 7 (Botswana, Gambia, Honduras), 8 (South Africa, Lesotho, Nigeria, Tanzania, New Zealand, Rhodesia, Kenya, Hong Kong, Malasia, Zambia), 9 (South West Africa, Lesotho, Sierra Leone, Nigeria, Somalia), 10 (Spanish Sahara, Canary Islands), 11 (Spanish Sahara), 12 (Canary Islands, Argenina, Guatemala, El Salvador, Dominican Republic, Nicaragua, Paraguay, Uruguay), 13 (Spanish Sahara, Canary Islands, Puerto Rico, Philippines, Nicaragua, Ecuador, Bolivia, Paraguay), 14 (Luxembourg, Gabon, Zaïre), 15 (Niger, Central African Republic, Luxembourg, Morocco, Mauritania, Mali, Dahomey), 16 (South West Africa), 17 (Surinam), 18 (South West African), 19 (South West Africa, Lesotho, Surinam), 20 (South West Africa, South Africa, Lesotho, Surinam, Zaïre), 21 (Mongolia), 22 (Includes only France, Canada, Switzerland, The Ivory Coast, Madagascar, Laos, Belgium), 23 (Includes only Italy), 24 (Figures unobtainable), 25 (Number of visitors to Switzerland in 1969 times distance from point of origin), 26 (Number of volumes in public libraries), 27 (Number of titles published per year in countries where the language is official).

SIGLA: D (Demographic indicator), R (Dispersion Indicator), M (Mobility Indicator), E (Economic Indicator), I (Ideological Indicator), C_1 (Cultural Indicator: potential), C_2 (Cultural Indicator: production), p (population), $max\ p$ (largest population), $\bar{r}$ (average annual income), n (number), d (central distance), v (volumes), $p.a.$ (annual production), GNP (gross national product), AFL (adherents using a foreign liturgical language).

TABLE II

Pressurs of English and French in Acadia (1961)

Indicators	Pressures	Proportions French	Proportions English
	Demographic:		
Proportion of the population	1. (3)	21	79
	2. Canada (1)	28	72
	3. Maritimes (N.B.) (1)	32	68
	Geographic:		
Non-contiguous states	4. World (2)	31	69
	5. Canada (1)	40	60
	Distribution:		
Land Mass	6. World (3)	26	74
	7. National (3)	35	65
	8. Régional (1)	60	40
	Culturel:		
As First Foreign Language	9. Dispersion (2)	41	59
	10. Intensit (3)	14	86
Printed Matter (regional)	11. Books (4)	17	83
	12. Monthlies (4)	16	84
	13. Weeklies (4)	16	84
	14. Dailies (4)	17	83
Broadcast hours (N.B.)	15. Radio (4)	31	69
	16. Télévision (4)	23	77
Films	17. Cinema (5)	01	99
	Economic:		
Production (G.N.P.)	18. Production (4)	44	56
	Educational:		
Schools	19. Schools (5)	27	73
Hours per week by language	20. Subjects (5)	28	72

Sources: 1. *Rapport de la Commission royale d'enquête sur le bilinguisme et le biculturalisme*, Ottawa, 1967. 2. H. Kloss et H. Dorion: Projets de démographie linguistique (Archives statistiques au C.I.R.B.). 3. E.G. Bowen (éd.), *A Physical and Regional Geography*, London, 1967. 4. *L'Annaire du Canada*, Ottawa, 1962. 5. Field Records (1958-67). Demographic note: Non-francophone ethnic minorities in Canada have been grouped with English-speaking population.

TABLE II

Concept Acculturation

(Moncton, 1961)

	actions	religion	instruments	sports	transport
1. Tokens:					
French	1900	1381	759	1268	1231
English	1859	1034	990	1639	1474
2. Types:					
French	491	357	202	341	254
English	434	263	314	438	251
3. Loans:					
From French	0	42	16	4	0
From English	10	4	62	109	127
4. Penetration:					
French into English	0%	16%	5%	1%	0%
English into French	2%	1%	31%	32%	50%

Number and percentage of French and English words supplied by forty-one ten-year-old Acadians in five paired (French and English) tests of controlled word association with: actions, religion (church and parish life), instruments (tools), sports, and transport (automobiles and their parts).

LANGUAGE PRESSURE AND CONCEPT ACCULTURATION

(REGION OF MONCTON)

1961

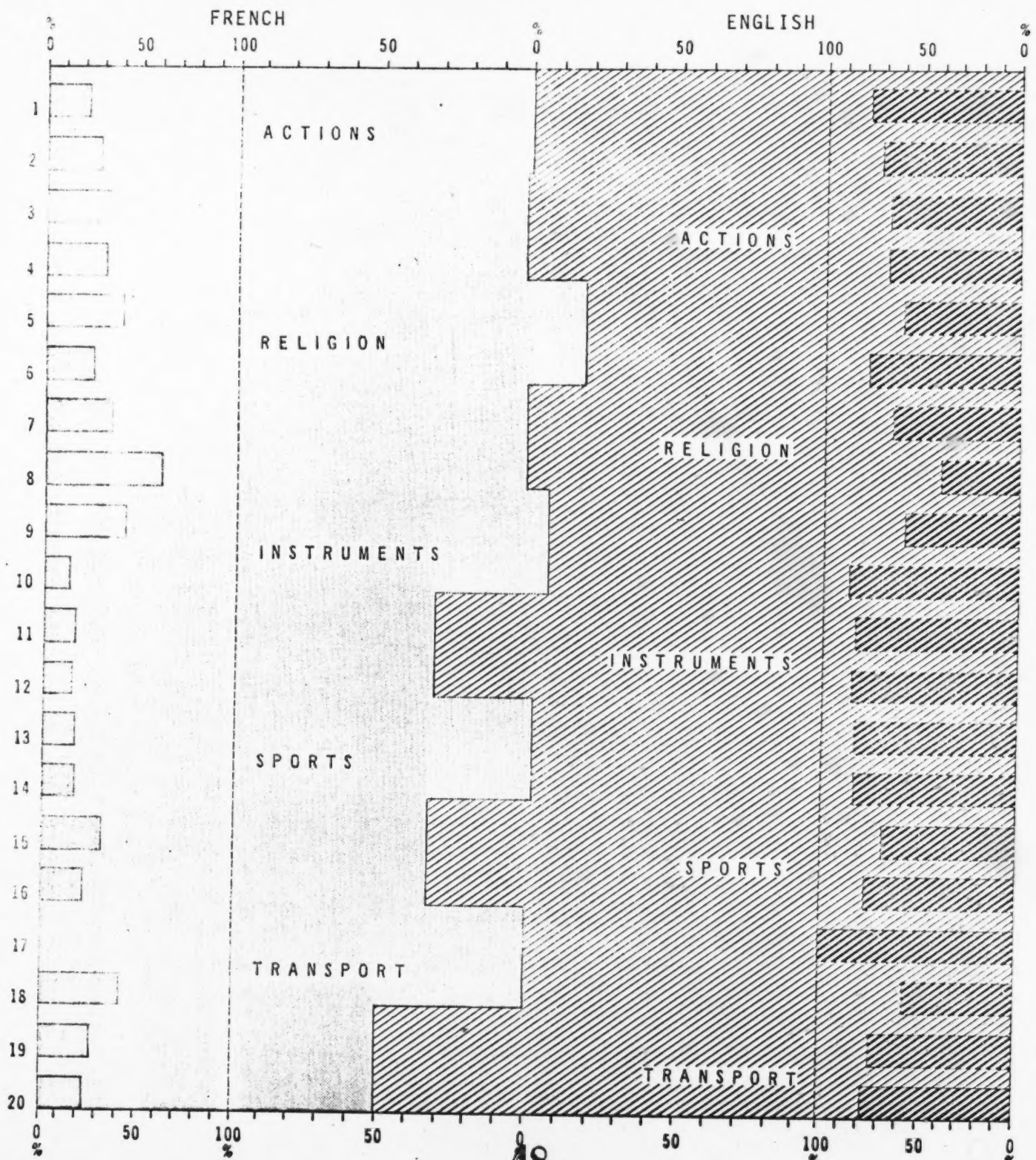

Figure 1

ALBANIAN

country	population	year	average income	year	G.N.P.	year	public library holdings (thou. vols.)	annual book production (n. titles)
Albania	2,019,000	1968	-	-	-	-	414	-
GERMAN								
German Federal Rep.	61,194,600	1969	2,512	1969	152,843	1969	46,576	33,454 (1969)
German Democratic Rep.	17,074,504	1969	-	-	-	-	24,666	5,568 (1968)
Switzerland	5,429,061	1960	2,965	1969	18,454	1969	6,902	7,505
Luxembourg	338,500	1969	2,580	1969	872	1969	-	-
Liechtenstein	338,500	1969	-	-	-	-	-	-
Austria	7,073,807	1961	1,687	1969	12,435	1969	3,418	5,204
ENGLISH								
United Kingdom	54,021,500	1969	1,976	1969	109,748	1969	77,200	32,538 (1971)
United States	204,765,770	1970	4,664	1969	947,800	1969	201, 138	62,083 (1969)
Canada	21,567,000	1971	3,074	1971	82,130	1971	21,635	3,659

ENGLISH (cont'd)

country	population	year	average income	year	G.N.P.	year	public library holdings (thou. vols.)	annual book production (n. titles)
Australia	12,551,700	1970	2,476	1968	29,786	1968	9,547	3,939
New Zealand	2,820,814	1970	1,918	1969	5,326	1969	2,891	-
South Africa	21,282,000	1970	717	1969	15,898	1969	-	2,641 (1967)
Botswana	543,105	1964	96	1966	55	1966	16	-
Rhodesia	5,090,000	1969	256	1969	1,303	1969	250	-
Lesotho	969,634	1966	88	1966	75	1966	-	-
Gambia	315,486	1963	81	1963	26	1963	22	-
Sierra Leone	2,490,000	1966	153	1967	373	1967	-	-
Liberia	1,098,985	1967	225	1968	254	1968	46	-
Ghana	8,545,561	1970	237	1968	1,987	1968	609	446
Nigeria	55,670,052	1963	76	1966	4,559	1966	-	-
Cameron	5,700,000	-	165	1968	936	1968	19	-
Ouganda	9,530,000	1969	118	1969	1,122	1969	88	-
Kenya	10,942,708	1969	136	1969	1,432	1969	144	-
Tanzania	12,231,342	1967	67	1963	708	1963	1,579	30
Malawi	4,039,583	1966	62	1969	271	1969	24	-
Zambia	3,894,200	1966	316	1968	1,288	1968	158	-

ENGLISH (cont'd)

country	population	year	average income	year	G.N.P.	year	public library holdings (thou. vols.)	annual book production (n. titles)
India	509,175,997	-	84	1967	43,000	1967	8,804	13,733
British Honduras	119,645	1970	259	1969	646	1969	74	-
Somalia	2,730,000	-	69	1963	160	1963	-	-
Hong-Kong	4,039,000	1970	442	1963	1,550	1963	174	-
Malaisia	8,899,030	1968	314	1966	3,057	1966	308	-
Singapore	2,033,500	1969	844	1969	1,703	1969	25	533
Philippines	37,008,419	1970	340	1969	12,634	1969	712	-

ARABIC

Morocco	11,598,070	1961	212	1969	3,184	1969	-	-
Algeria	13,200,000	1969	248	1963	2,773	1963	61	289 (1968)
Tunisia	4,730,000	1969	213	1968	1,048	1968	331	-
Spanish Sahara	55,000	-	-	-	-	-	5	-
Mauritania	1,100,000	1969	155	1966	166	1966	-	-
Mali	4,700,000	1967	88	1966	405	1966	-	-

ARABIC (cont'd)

country	population	year	average income	year	G.N.P.	year	public library holdings (thou. vols.)	annual book production (I) (n. titles)
Niger	3,640,000	1968	88	1966	319	1966	-	-
Sénégal	3,500,000	1965	225	1968	830	1968	52	-
Nigéria	55,670,032	1963	76	1966	4,559	1966	-	-
Libye	1,800,000	1968	1,412	1968	2,545	1968	29	-
United Arab Republic	25,984,000	1960	102	1968	6,090	1968	825	1,699
Chad	3,500,000	1969	64	1967	220	1967	8	-
Sudan	10,262,674	1968	109	1967	1,560	1967	-	-
Ethiopia	22,667,400	1967	63	1967	1,480	1967	105	-
Syria	5,700,000	1968	214	1966	1,160	1966	288	-
Jordan	2,200,000	1969	263	1968	553	1968	45	224
Iran	25,781,090	1966	295	1968	7,960	1968	-	-
Irak	8,765,915	1968	279	1968	2,520	1968	403	569
Saudi Arabia	6,000,000	-	351	1967	2,452	1967	71	-
Yemen	4,500,000	1953	48	1958	240	1958	-	-
South Yemen Republic	1,500,000	-	167	1963	179	1963	41	-
Muscat and Onan	750,000	-	62	1958	34	1958	-	-

Moslems outside Arab countries (in millions):

BULGARIAN

country	population	year	average income	year	G.N.P.	year	public library holdings (thou. vols.)	annual book production (n. titles)
Bulgaria	8,467,300	1970	-	-	-	-	28,046	3,548
DANISH								
Denmark	4,912,865	1970	2,860	1969	13,989	1969	16,001	4,978
SPANISH								
Spain	32,411,407	1968	872	1969	28,739	1969	3,412	20,031 (1969)
Spanish Sahara	55,000	-	-	-		-	5	-
Mexico	48,313,438	1970	566	1968	26,744	1968	1,607	4,558 (1967)
Canaries	908,718	1959	-	-	-	-	-	-
Puerto Rico	2,210,703	1960	1,663	1969	4,579	1969	159	-
Cuba	8,100,000	1968	-	-	-	-	449	995
Dominican Republic	4,174,490	1969	290	1968	1,169	1968	-	71 (1963)
Philippines	37,008,419	1970	340	1969	12,634	1969	712	-

SPANISH (cont'd)

country	population	year	average income	year	G.N.P.	year	public library holdings (thou. vols.)	annual book production (n. titles)
Guatemala	5,400,000	1970	328	1969	1,645	1969	-	335 (1968)
El Salvador	3,150,000	1968	279	1969	945	1969	-	27 (1967)
Honduras	2,490,000	1969	259	1969	646	1969	74	189 (1962)
Nicaragua	1,780,000	1969	380	1969	728	1969	-	-
Costa Rica	1,680,000	1969	489	1969	824	1969	2,839	294 (1968)
Panama	1,414,737	1970	647	1969	917	1969	57	195
Venezuela	9,600,000	1968	944	1968	9,146	1968	194	747 (1963)
Colombia	21,160,000	1970	360	1969	7,366	1969	547	704 (1965)
Peru	13,586,000	1970	291	1968	3,718	1968	240	783 (1968)
Ecuador	5,585,400	1967	251	1969	1,477	1969	2,540	-
Bolivia	5,062,500	1971	190	1969	911	1969	120	-
Chili	9,670,000	1969	610	1969	5,830	1969	944	1,546 (1968)
Argentina	23,219,000	1970	828	-	19,860	-	-	3,645 (1967)
Paraguay	2,395,614	1970	236	1969	543	1969	-	-
Uruguay	2,780,000	1967	650	1969	1,833	1969	-	341 (1967)

FINNISH

country	population	year	average income	year	G.N.P.	year	public library holdings (thou. vols.)	annual book production (n. titles)
Finland	4,707,000	1969	1,949	1969	9,143	1969	-	3,646

FRENCH

Canada	21,561,000	1971	3,074	1971	92,130	1971	21,635	3,659
Switzerland	5,429,061	1960	2,965	1969	18,454	1969	6,902	7,505
Luxembourg	338,500	1969	2,580	1969	872	1969	-	-
Morocco	11,598,070	1961	212	1969	3,184	1969	-	-
Algeria	13,200,000	1969	248	1963	2,773	1963	61	-
Tunisia	4,730,000	1969	213	1968	1,048	1968	331	-
Mauritania	1,100,000	1969	155	1966	166	1966	-	-
Mali	4,700,000	1967	88	1966	405	1966	-	-
Niger	3,640,000	1968	88	1966	319	1966	-	-
Sénégal	3,500,000	1965	225	1968	830	1968	52	-
Tchad	3,500,000	1969	64	1969	220	1967	8	-
France	50,500,000	1970	2,783	1969	140,050	1969	29,040	21,571 (1970)

FRENCH (cont'd)

country	population	year	average income	year	G.N.P.	year	public library holdings (thou. vols.)	annual book production (n. titles)
Guinea	3,800,000	1968	99	1963	333	1963	2	-
Ivory Coast	3,840,000	1965	304	1968	1,248	1968	35	38
Upper Volta	5,330,000	1969	49	1966	245	1966	29	-
Togo	1,955,916	1970	124	1966	209	1966	11	-
Dahomey	2,370,000	1965	81	1966	194	1966	-	-
Cameroun	5,700,000	-	165	1968	936	1968	19	-
West Africa Republic	1,466,000	1967	108	1963	141	1963	-	-
Gabon	475,000	1970	565	1967	267	1967	6	-
Congo	900,000	1967	188	1963	153	1963	20	-
Zaïre	21,637,876	1970	79	1968	1,330	1968	229	-
Rouanda	3,300,000	-	42	1966	135	1966	10	-
Burundi	3,500,000	-	46	1963	141	1963	26	-
Madagascar	6,776,970	-	120	1968	778	1968	16	156
Haïti	4,700,000	1968	91	1968	423	1968	35	-
Laos	2,700,000	-	67	-	168	-	16	57
Belgium	9,660,154	1969	2,372	1969	22,878	1969	14,648	5,089

GAELIC

country	population	year	average income	year	G.N.P.	year	public Library holdings (thou. vols.)	annual book production (n. titles)	(I)
Ireland	4,368,777	1966	1,169	1969	3,415	1969	3,300	467	
GREEK									
Greece	8,610,000	1966	858	1968	7,554	1968	1,093	-	55
Cyprus	630,000	1969	704	1968	438	1968	123	341	
HEBREW									
Israel	2,999,000	1971	1,663	1969	4,692	1969	3,500	2,038	
Orthodox Jews outside Israel (in millions)									11
ITALIAN									
Italy	54,418,831	1970	1,548	1969	83,330	1969	41,000	8,440	
Somalia	2,730,000	-	69	1963	160	1963	-	-	

HUNGARIAN

country	population	year	average income	year	G.N.P.	year	public library holdings (thou. vols.)	annual book production (n. titles)
Hungary	10,314,152	1970	-	-	-	-	22,122	4,831

NETHERLANDISH (incl. Afrikaans + Flemmish)

Netherlands	12,957,621	1969	2,196	1969	28,271	1969	-	11,204
South Africa	21,282,000	1970	717	1969	15,898	1969	-	2,641
South West Africa	749,000	1970	-	-	-	-	-	-
Lesoth	969,634	1966	88	1966	75	1966	-	-
Surinam	400,000	1970	375	1963	118	1963	-	-
Belgium	9,660,154	1969	2,372	1969	22,878	1969	14,648	5,089
Zaïre	21,637,876	1970	79	1968	1,330	1968	229	-

NORWEGIAN

Norway	3,866,468	1970	2,528	1969	9,734	1969	7,350	3,935

POLISH

country	population	year	average income	year	G.N.P.	year	public library holdings (thou. vols.)	annual book production (n. titles)
Poland	32,670,000	1970	-	-	-	-	49,659	9,413

PORTUGUESE

Portugal	9,582,600	1969	529	1968	5,009	1968	5,552	-
Portuguese Guinea	521,336	1960	71	1963	37	1963	-	-
Angola	5,000,000	-	71	1963	358	1963	-	-
Mozambique	6,663,653	1960	71	1963	482	1963	79	-
Bresil	92,237,570	1970	337	1968	29,817	1968	270	-
Macao	169,299	1960	-	-	-	-	7	-

ROMANIAN

Romania	20,140,000	1970	-	-	-	-	43,252	7,440

RUSSIAN

country	population	year	average income	year	G.N.P.	year	public library holdings (thou. vols.)	annual book production (n. titles)
U.S.S.R.	241,700,000	1970	-	-	320,000	1969	1,258,655	74,611
Mongolia	1,200,000	1970	-	-	-	-		-
SWIDISH								
Sweden	8,013,696	1969	3,315	1968	26,250	1968	-	7,404
Finland	4,707,000	1969	1,944	1969	9,143	1969	-	3,646
SLOVAK								
Czechoslovakia	14,333,259	1968	-	-	-	-	29,761	-
SERBO-CROATION								
Yugoslavia	20,529,000	1970	-	-	-	-	11,598	8,708

SOURCES

Languages:

Figures for the selected languages are taken from those for the countries where the languages are listed as "official" or "major" languages in the Hamond Medallion World Atlas, New York, Hamond, 1969.

Indicator *D*

Population (p)

Paxton, John,(ed.) *The Stateman's Yearbook. Statistical and historical annual of the states of the world for the year 1971-1972.*

Average income ($\bar{r}$)

Gross national product per capita at market values (in U.S. dollars)

Annuaire statistique des Nations Unies: 1970.

For Canada: *Statistique Canada*:: 1970.

Indicator *R*

As for *D* (above).

Indicator *M*

For Switzerland only:

Annuaire statistique de la Suisse: 1969.

Encyclopaedia Britannica: World Atlas.

Reed's Tables of Distances (11 ed.). Whittingham, H. and King, C.T., (eds.), Sunderland, Thos. Reed, 1947.

Indicator *F*

G.N.P.:

Annuaire statistique des Nations Unies: 1970. p. 603-605.

For Canada: *Statistique Canada.*

For U.S.S.R.: 1969 estimate based on Banks 1963 (Ref. 9)

Indicator *I*

Religious Affiliation:

Coxill, Wakelin H. *World Christian Handbook : 1965.*

Indicator C_1

Annuaire statistique UNESCO: 1970. p. 596-606.

Indicator C_2

Annuaire statistique UNESCO: 1970.

Except for:
(1970) France: *Bibliographie de la France* 50. 15/12/71.
(1971) United Kingdom: *The Bookseller* 3445. 1/1/72.
(1963) German Federal Republic: *Statistisches Jahrbuch für die Bundesrepublik Deutschland: 1965.*
(1965) German Democratic Republic: *Statistisches Jahrbuch der deutschen demokratischen Republik: 1967.*

REFERENCES

1. Kenneth McRae. *Switzerland : Example of Cultural Coexistence.* Toronto, Canadian Institute of International Affairs, 1964.

2. Robert LePage. *The National Language Question.* Londres, Oxford University Press, 1964.

3. Karl W. Deutsch. *Nationalism and Social Communication.* (2e éd.) Cambridge (Mass.), MIT Press, 1966.

4. J.A. Fishman, C.A. Ferguson et J. Das Gupta (éd.). *Language Problems of Developing Nations.* New York Wiley, 1968.

5. William A. Stewart. A Sociolinguistic Typology for Describing National Multilingualism, in J.A. Fishman (ed.) *Readings in the Sociology of Language.* La Haye, Mouton, 1968.

6. Heinz Kloss. "Abstand Languages" and "Ausbau Languages". *Anthropological Linguistics* 9(1967)29-41.

7. _____. Types of Multilingual Communities : A Discussion of Ten Variables. *Sociological Inquiry* 36(1966)135-45.

8. Stanley Lieberson. An Extension of Greenberg's Linguistic Diversity Measures. *Language* 40(1964)526-31.

9. Arthur S. Banks et Robert B. Textor. *A Cross-Polity Survey.* Cambridge (Mass.), MIT Press, 1963.

10. B.M. Russett, H.A. Alker, K.W. Deutsch et H.D. Lasswell. *World Handbook of Political and Social Indicators.* New Haven (Conn.), Yale University Press, 1964.

11. Léon Dion. Fondements et composantes des relations interethniques au Canada, in *Le Canada face à l'avenir.* Institut canadien des affaires publiques, 1964.

12. G.P. Murdock *et al.* *Outline of World Cultures* (3e éd.). New Haven (Conn.), Yale University Press, 1963.

13. Frederick Harbison et C.A. Myers. *Education, Manpower and Economic Growth.* New York, McGraw-Hill, 1964.

14. Karl W. Deutsch. Social Mobilization and Political Development. *American Political Science Review* 55(1961)493-515.

15. Daniel Lerner. *The Passing of Traditional Society.* Glencoe (Ill.), Free Press, 1958.

16. G. Héraud. *L'Europe des ethnies.* Paris, Presses d'Europe, 1963.

17. M.G. Bartoli. *Saggi di linguistica spaziale.* Turin, Bona, 1945.

18. W.F. Mackey. *La distance interlinguistique.* (sous presse)

19. Isidore Dyen. On the Validity of Comparative Lexicostatistics. *Proceedings of the Ninth International Congress of Linguistics.* p. 238-50.

20. [Willy Brandt, P. Moisy *et al.*] *Festschrift zur Feier des 275-jährigen Bestehens des Französischen Gymnasiums -- Collège français fondé en 1689.* Berlin, Erich Pröh, 1965.

21. Jacques Brazeau. Language Differences and Occupational Experience. *Canadian Journal of Economic and Political Science* 4(1958)536-46.

22. Selim Abou. *Le bilinguisme arabe-français au Liban.* Paris, Presses universitaires de France, 1962.

23. Joshua A. Fishman. The Links between Micro and Macro Sociolinguistics in the Study of Who Speaks What Language to Whom and When, in Dell Hymes et John J. Gumperz (éd.) *The Ethnography of Communication.* New York, Holt, 1972.

24. W.F. Mackey. The Description of Bilingualism, in J.A. Fishman (éd.) *Readings in the Sociology of Language.* La Haye, Mouton, 1968.

25. ————. Concept Categories as Measures of Intercultural Differences, in *Man, Language and Society : Festschrift Claude Lévi-Strauss.* La Haye, Mouton. (sous presse)

26. Georges Balandier. *Sens et puissance.* Paris, Presses universitaires de France, 1971.

27. W.F. Mackey. Interference, Integration and the Synchronic Fallacy. *Monograph Series on Languages and Linguistics* 23(1970). Washington, Georgetown University Press.

28. Incorporated Association of Assistant Masters in Secondary Schools. *The Teaching of Modern Languages.* Londres, University of London Press, 1952.

ANNEXE STATISTIQUE

Tout chercheur qui s'aventure dans la comparaison des statistiques nationales se heurte au problème de la comparabilité. Pour être entièrement comparables, il faut que les données soient cueillies en même temps, de la même façon, et dans les mêmes catégories -- ce qui est rarement le cas pour deux pays différents. Par exemple, les chiffres émis par les services statistiques d'un pays pour indiquer le nombre de volumes dans les bibliothèques pourront bien exclure le nombre de volumes dans les bibliothèques privées, municipales, et universitaires, tandis que d'autres pays pourront tout inclure. Il y a aussi divergence dans la définition de l'unité -- dans ce qui compte, par exemple, comme volume. Certains pays peuvent compter chaque numéro de chaque journal, les cartes géographiques, les photos et des documents, tandis que d'autres pays se borneront aux livres. De telles divergences peuvent rendre difficile, sinon impossible, la comparaison des statistiques de certains pays. De sorte que, en dernière analyse, nous ne pouvons atteindre que des approximations -- résultats qui sont utilisables dans la mesure où la tolérance d'erreur est suffisante pour nous permettre d'établir des numéros d'ordre.

Toutefois, depuis sa création à la fin de la Deuxième Guerre mondiale, l'Organisation des Nations Unies, par ses organismes, a énormément contribué à la standardisation -- voire, à la qualité --

des statistiques internationales, et indirectement, à la comparabilité des statistiques nationales.

Il y aura toujours, néanmoins, des difficultés qui sont inhérentes dans la nature des faits disponibles. Comment savoir, par exemple, combien de personnes possèdent telle ou telle langue si on n'a pas de définition fonctionnelle des connaissances linguistiques? Pour notre étude, nous avons opté pour le nombre de personnes qui habitent les pays où la langue est répandue*, et non pas pour le nombre de personnes qui sont capables d'utiliser la langue; puisque c'est l'influence et non pas la compétence que nous mesurons. Dans les pays bilingues cela a tendance à valoriser la langue minoritaire qui est reconnue comme étant officielle -- de valoriser, par exemple, le suédois en Finlande et le français au Canada.

Après avoir vu les différences de méthode, de définition et de disponibilité des statistiques nationales, c'est avec toute caution que nous présentons ce qui suit.

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* On a choisi, à titre d'exemple, une vingtaine de langues qui figurent comme langues officielles ou "major languages" dans le *Hamond Medallion World Atlas* (New York, Hamond 1969) et dont une dizaine ont été utilisées pour construire le tableau numéro 1.

pays	population	année	revenu moyen	année	P.N.B.	année	n. de vol. en biblio. (en milliers)	n. de vol. (titres) par année
ALBANAIS								
Albanie	2,019,000	1968	-	-	-	-	414	-
ALLEMAND								
R.F.A.	61,194,600	1969	2,512	1969	152,843	1969	46,576	33,454 (1969)
R.D.A.	17,074,504	1969	-	-	-	-	24,666	5,568 (1968)
Suisse	5,429,061	1960	2,965	1969	18,454	1969	6,902	7,505
Luxembourg	338,500	1969	2,580	1969	872	1969	-	-
Liechtenstein	338,500	1969	-	-	-	-	-	-
Autriche	7,073,807	1961	1,687	1969	12,435	1969	3,418	5,204
ANGLAIS								
Royaume-Uni	54,021,500	1969	1,976	1969	109,748	1969	77,200	32,538 (1971)
Etats-Unis	204,765,770	1970	4,664	1969	947,800	1969	201,138	62,083 (1969)
Canada	21,567,000	1971	3,074	1971	92,130	1971	21,635	3,659
Australie	12,551,700	1970	2,476	1968	29,786	1968	9,547	3,939
Nll-Zélande	2,820,814	1970	1,918	1969	5,326	1969	2,891	-

pays	population	année	revenu moyen	année	P.N.B.	année	n. de vol. en biblio. (en milliers)	n. de vol. (titres) par année
ANGLAIS (suite)								
Afrique du Sud	21,282,000	1970	717	1969	15,898	1969	-	2,641 (1967)
Botswana	543,105	1964	96	1966	55	1966	16	-
Rhodésie	5,090,000	1969	256	1969	1,303	1969	250	-
Lesotho	969,634	1966	88	1966	75	1966	-	-
Gambie	315,486	1963	81	1963	26	1963	22	-
Sierra Leone	2,490,000	1966	153	1967	373	1967	-	-
Liberia	1,098,985	1967	225	1968	254	1968	46	-
Ghana	8,545,561	1970	237	1968	1,987	1968	609	446
Nigéria	55,670,052	1963	76	1966	4,559	1966	-	-
Cameroun	5,700,000	-	165	1968	936	1968	19	-
Ouganda	9,530,000	1969	118	1969	1,122	1969	88	-
Kenya	10,942,708	1969	136	1969	1,432	1969	144	-
Rép.de Tanzanie	12,231,342	1967	67	1963	708	1963	1,579	30
Malawi	4,039,583	1966	62	1969	271	1969	24	-
Zambie	3,894,200	1966	316	1968	1,288	1968	158	-
Inde	509,175,997	-	84	1967	43,000	1967	8,804	13,733

pays	population	année	revenu moyen	année	P.N.B.	année	n. de vol. en biblio. (en milliers)	n. de vol. (titres) par année
ANGLAIS (suite)								
British Honduras	119,645	1970	259	1969	646	1969	74	-
Rép.de Somalie	2,730,000	-	69	1963	160	1963	-	-
Hong-Kong	4,039,000	1970	442	1963	1,550	1963	174	-
Malaisie	8,899,030	1968	314	1966	3,057	1966	308	-
Singapour	2,033,500	1969	844	1969	1,703	1969	25	533
Rép.des Philippines	37,008,419	1970	340	1969	12,634	1969	712	-
ARABE								
Maroc	11,598,070	1961	212	1969	3,184	1969	-	-
Algérie	13,200,000	1969	248	1963	2,773	1963	61	289 (1968)
Tunisie	4,730,000	1969	213	1968	1,048	1968	331	-
Sahara espagnol	55,000	-	-	-	-	-	5	-
Mauritanie	1,100,000	1969	155	1966	166	1966	-	-
Mali	4,700,000	1967	88	1966	405	1966	-	-
Niger	3,640,000	1968	88	1966	319	1966	-	-

pays	population	année	revenu moyen	année	P.N.B.	année	n. de vol. en biblio. (en milliers)	n. de vol. (titres) par année (I)
ARABE (suite)								
Sénégal	3,500,000	1965	225	1968	830	1968	52	-
Nigéria	55,670,032	1963	76	1966	4,559	1966	-	-
Libye	1,800,000	1968	1,412	1968	2,545	1968	29	-
R.A.U.	25,984,000	1960	102	1968	6,090	1968	825	1,699
Tchad	3,500,000	1969	64	1967	220	1967	8	-
Soudan	10,262,674	1968	109	1967	1,560	1967	-	-
Ethiopie	22,667,400	1967	63	1967	1,480	1967	105	-
Syrie	5,700,000	1968	214	1966	1,160	1966	288	-
Jordanie	2,200,000	1969	263	1968	553	1968	45	224
Iran	25,781,090	1966	295	1968	7,960	1968	-	-
Irak	8,765,915	1968	279	1968	2,520	1968	403	569
Arabie Saoudite	6,000,000	-	351	1967	2,452	1967	71	-
Yemen	4,500,000	1953	48	1958	240	1958	-	-
Rép.pop.du Yémen du Sud	1,500,000	-	167	1963	179	1963	41	-
Mascate et Onan	750,000	-	62	1958	34	1958	-	-

Musulmans en dehors des pays arabophones (en millions):

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pays	population	année	revenu moyen	année	P.N.B.	année	n. de vol. en biblio. (en milliers)	n. de vol. (titres) par année
BULGARE								
Bulgarie	8,467,300	1970	-	-	-	-	28,046	3,548
DANOIS								
Danemark	4,912,865	1970	2,860	1969	13,989	1969	16,001	4,978
ESPAGNOL								
Espagne	32,411,407	1968	872	1969	28,739	1969	3,412	20,031 (1969)
Sahara espagnol	55,000	-	-	-	-	-	5	-
Mexique	48,313,438	1970	566	1968	26,744	1968	1,607	4,558 (1967)
Iles Canaries	908,718	1959	-	-	-	-	-	-
Puerto Rico	2,210,703	1960	1,663	1969	4,579	1969	159	-
Cuba	8,100,000	1968	-	-	-	-	449	995
Rép.Dominicaine	4,174,490	1969	290	1968	1,169	1968	-	71 (1963)
Rép.des Philippines	37,008,419	1970	340	1969	12,634	1969	712	-
Guatemala	5,400,000	1970	328	1969	1,645	1969	-	335 (1968)

pays	population	année	revenu moyen	année	P.N.B.	année	n. de vol. en biblio. (en milliers)	n. de vol. (titres) par année
ESPAGNOL (suite)								
El Salvador	3,150,000	1968	279	1969	945	1969	-	27 (1967)
Honduras	2,490,000	1969	259	1969	646	1969	74	189 (1962)
Nicaragua	1,780,000	1969	380	1969	728	1969	-	-
Costa Rica	1,680,000	1969	489	1969	824	1969	2,839	294 (1968)
Panama	1,414,737	1970	647	1969	917		57	195
Venezuela	9,600,000	1968	944	1968	9,146	1968	194	747 (1963)
Colombie	21,160,000	1970	360	1969	7,366	1969	547	704 (1965)
Pérou	13,586,000	1970	291	1968	3,718	1968	240	783 (1968)
Equateur	5,585,400	1967	251	1969	1,477	1969	2,540	-
Bolivie	5,062,500	1971	190	1969	911	1969	120	-
Chili	9,670,000	1969	610	1969	5,830	1969	944	1,546 (1968)
Argentine	23,219,000	1970	828	-	19,860	-	-	3,645 (1967)
Paraguay	2,395,614	1970	236	1969	543	1969	-	-
Uruguay	2,780,000	1967	650	1969	1,833	1969	-	341 (1967)
FINLANDAIS								
Finlande	4,707,000	1969	1,949	1969	9,143	1969	-	3,646

pays	population	année	revenu moyen	année	P.N.B.	année	n. de vol. en biblio. (en milliers)	n. de vol. (titres) par année
FRANCAIS								
Canada	21,561,000	1971	3,074	1971	92,130	1971	21,635	3,659
Suisse	5,429,061	1960	2,965	1969	18,454	1969	6,902	7,505
Luxembourg	338,500	1969	2,580	1969	872	1969	-	-
Maroc	11,598,070	1961	212	1969	3,184	1969	-	-
Algérie	13,200,000	1969	248	1963	2,773	1963	61	-
Tunisie	4,730,000	1969	213	1968	1,048	1968	331	-
Mauritanie	1,100,000	1969	155	1966	166	1966	-	-
Mali	4,700,000	1967	88	1966	405	1966	-	-
Niger	3,640,000	1968	88	1966	319	1966	-	-
Sénégal	3,500,000	1965	225	1968	830	1968	52	-
Tchad	3,500,00	1969	64	1969	220	1967	8	-
France	50,500,000	1970	2,783	1969	140,050	1969	29,040	21,571 (1970)
Guinée	3,800,000	1968	99	1963	333	1963	2	-
Côte d'Ivoire	3,840,000	1965	304	1968	1,248	1968	35	38
Haute Volta	5,330,000	1969	49	1966	245	1966	29	-
Togo	1,955,916	1970	124	1966	209	1966	11	-

pays	population	année	revenu moyen	année	P.N.B.	année	n. de vol. en biblio. (en milliers)	n. de vol. (titres) par année
FRANCAIS (suite)								
Dahomey	2,370,000	1965	81	1966	194	1966	-	-
Cameroun	5,700,000	-	165	1968	936	1968	19	-
Rép.d'Afrique centrale	1,466,000	1967	108	1963	141	1963	-	-
Gabon	475,000	1970	565	1967	267	1967	6	-
Rép.du Congo	900,000	1967	188	1963	153	1963	20	-
Rép.dém.du Congo	21,637,876	1970	79	1968	1,330	1968	229	-
Rouanda	3,300,000	-	42	1966	135	1966	10	-
Burundi	3,500,000	-	46	1963	141	1963	26	-
Madagascar	6,776,970	-	120	1968	778	1968	16	156
Haïti	4,700,000	1968	91	1968	423	1968	35	-
Laos	2,700,000	-	67	-	168	-	16	57
Belgique	9,660,154	1969	2,372	1969	22,878	1969	14,648	5,089
GAELIQUE								
Irlande	4,368,777	1966	1,169	1969	3,415	1969	3,300	467

pays	population	année	revenu moyen	année	P.N.B.	année	n. de vol. en biblio. (en milliers)	n. de vol. (titres) par année	(I)
GREC									
Grèce	8,610,000	1966	858	1968	7,554	1968	1,093	-	
Chypre	630,000	1969	704	1968	438	1968	123	341	
HEBREU									
Israël	2,999,000	1971	1,663	1969	4,692	1969	3,500	2,038	
Juifs ortho. en dehors d'Israël (en millions):									11
ITALIEN									
Italie	54,418,831	1970	1,548	1969	83,330	1969	41,000	8,440	
Rép.de Somalie	2,730,000	-	69	1963	160	1963	-	-	
HONGROIS									
Hongrie	10,314,152	1970	-	-	-	-	22,122	4,831	
NEERLANDAIS - AFRIKANER - FLAMAND									
Pays-Bas	12,957,621	1969	2,196	1969	28,271	1969	-	11,204	
Afrique du Sud	21,282,000	1970	717	1969	15,898	1969	-	2,641	

pays	population	année	revenu moyen	année	P.N.B.	année	n. de vol. en biblio. (en milliers)	n. de vol. (titres) par année
NEERLANDAIS - AFRIKANER - FLAMAND								
Afrique du S.O.	749,000	1970	-	-	-	-	-	-
Lesotho	969,634	1966	88	1966	75	1966	-	-
Surinam	400,000	1970	375	1963	118	1963	-	-
Belgique	9,660,154	1969	2,372	1969	22,878	1969	14,648	5,089
Rép.dém.du Congo	21,637,876	1970	79	1968	1,330	1968	229	-
NORVEGIEN								
Norvège	3,866,468	1970	2,528	1969	9,734	1969	7,350	3,935
POLONAIS								
Pologne	32,670,000	1970	-	-	-	-	49,659	9,413
PORTUGAIS								
Portugal	9,582,600	1969	529	1968	5,009	1968	5,552	-
Guinée Portugaise	521,336	1960	71	1963	37	1963	-	-
Angola	5,000,000	-	71	1963	358	1963	-	-

pays	population	année	revenu moyen	année	P.N.B.	année	n. de vol. en biblio. (en milliers)	n. de vol. (titres) par année
PORTUGAIS (suite)								
Mozambique	6,663,653	1960	71	1963	482	1963	79	-
Brésil	92,237,570	1970	337	1968	29,817	1968	270	-
Macao	169,299	1960	-	-	-	-	7	-
ROUMAIN								
Roumanie	20,140,000	1970	-	-	-	-	43,252	7,440
RUSSE								
U.R.S.S.	241,700,000	1970	-	-	320,000	1969	1,258,655	74,611
Mongolie	1,200,000	1970	-	-	-	-	-	-
SUEDOIS								
Suède	8,013,696	1969	3,315	1968	26,250	1968	-	7,404
Finlande	4,707,000	1969	1,944	1969	9,143	1969	-	3,646
SLOVAQUIE								
Tchécoslovaquie	14,333,259	1968	-	-	-	-	29,761	-

pays	population	année	revenu moyen	année	P.N.B.	année	n. de vol. en biblio. (en milliers)	n. de vol. (titres) par année
SERBO-CROATE								
Yougoslavie	20,529,000	1970	-	-	-	-	11,598	8,708

SOURCES

Indice *D*

Population (p)

Paxton, John, éd. *The Stateman's Yearbook. Statistical and historical annual of the states of the world for the year 1971-1972.*

Revenu moyen ($\bar{r}$)

Produit brut par habitant au prix du marché (en dollars des E.U.).
Annuaire statistique des Nations Unies 1970. P. 603-605.

Canada: *Statistique Canada*, 1971.

Indice *R*

Idem indice *D*.

Indice *M*

Seulement pour la Suisse:
Annuaire statistique de la Suisse. 1969.

Encyclopaedia Britannica. World Atlas.

Whittingham, H. et King, C.T. *Reed's Tables of Distances.* 11ème éd., Sunderland, Thos. Reed, 1947.

Indice *E*

P.N.B.

Produit national brut aux prix courants du marché (millions de dollars).
Annuaire statistique des Nations Unies 1970. P. 603-605.

Excepté pour le Canada: Le "Soleil" du 4 mars 1972, p. 35.

Extrait de *Statistique Canada.*

U.R.S.S.: (estimation 1969) (voir *Référence no 9*).

Indice *I*

Adhérents aux religions.

Chiffre global pour les musulmans en dehors des pays arabophones et des hébreux en dehors d'Israël.
Coxill, Wakelin H. *World Christian Handbook. 1965.*

Indice C_1

Nombre de volumes dans les bibliothèques publiques.

Annuaire statistique UNESCO. P. 596-606.

Indice C_2

Production annuelle de volumes.

Annuaire statistique UNESCO. 1970.
Annuaire statistique des Nations Unies 1970.

Excepté:
(pour 1970) France: *Bibliographie de la France* 50. 15/12/71.
(pour 1971) Royaume Uni: *The Bookseller* 3445. 1/1/72.
R.F.A.: *Statistiches Jahrbuch fllr die Bundesrepublik Deutschland. 1965.* (chiffres pour 1963).
R.D.A.: *Statistiches Jahrbuch der Deutschen demokratischen Republik. 1967.* (chiffres pour 1965).